

The *Lithops coleorum* colony restoration project

Lithops coleorum Hammer & Uijs is undoubtedly the most endangered and rarest *Lithops* species in habitat at present. It was first discovered early in 1992 when Anton van Buuren came across these plants on a farm west of Mokopane, South Africa. A single specimen was collected and brought to the University of Pretoria where Dr Niko Sauer added it to his collection of succulent plants. The plant was shown to Steven Hammer when he visited South Africa during September 1992 and together with Dr Ronald Uijs, Kotie Retief and Anton van Buuren they visited the

colony on 8 September 1992. A single type specimen of this new species was collected together with a few dried fruits. The plants were later described as a new species (Hammer and Uijs 1994) and named for Prof Desmond T. Cole and Mrs Naureen A. Cole, pioneers of *Lithops* research in southern Africa.

The plants occur in a relatively small area of stained quartzite pebbles mostly of alluvial origin surrounded by thickets of trees and scrubs (Earlé and Round 2021)(Fig1). Because of the restricted suitable habitat, a fairly accurate plant count was possible during the initial visit to the colony in 1992 when the total population was estimated to be at least 400 plants (S. Hammer pers. comm.). A second site less than 100 m from where the plants were

¹Lithopsfoundation@yahoo.co.uk

Lithops Research & Conservation Foundation, Alte Kalköfen Lodge, Bethanie District, Namibia



1: The habitat of *Lithops coleorum* consisting of stained quartzite pebbles.



2: A cluster of eight heads of *Lithops coleorum* photographed in habitat during a visit to the colony in 2012 by Keith Green.

first found was discovered soon after and a visit to the colonies in 2010 by Keith Green, Desmond Cole and Naureen Cole located about 20 plants. One of these was a cluster of eight heads (Fig. 2). Two years later, in 2012, again only 20 plants could be found in habitat (Jainta 2017) but it is not stated whether both of the colonies were explored. During a count in 2019, only 15 plants were found to have survived in the two colonies. The latest count in 2022 put the population at 14 plants at these two locations. Three of the plants were immature single-headed plants all of the same age, while the adult plants were mostly multi-headed with two, three or four heads giving a total of 25 individual heads in the colonies. Many of the plants showed unequal sized head formation (Fig. 3) which is also often seen in other species usually after a period of stress such as drought (Earlé and Schoeman 2012). In all, 56 % (14) of these heads flowered in the 2022 season and healthy developing fruits were present on all of these plants (Fig. 4).



3: An in-habitat *Lithops coleorum* plant showing unequal sized head formation presumably due to environmental stress.



4: A well developed fruit on a *Lithops coleorum* plant after flowering several weeks earlier. Note the smaller young plant next to the adult plant.



5: A monitoring photograph of a *Lithops coleorum* plant which includes a 1 cm x 3 cm marker in the photo.

The reason for this decline of the population to less than 4 % of its size when first discovered is not clear but it seems as if the majority of the plants were removed from habitat by collectors eager to get this new species into their collections. Furthermore, a large area of the open rock and pebble habitat was fenced off from the thick and often impenetrable surrounding bush and heavy hoofed animals such as horses and donkeys were kept within the fenced area. This practice surely crushed and thus destroyed many of the plants.

The decline in the population to this level is of serious concern and drastic measures are needed to safeguard the few plants still in habitat. The *Lithops* Research and Conservation Foundation moved the colony restoration project of *Lithops coleorum* to the top of the conservation priorities list after the 2022 visit to the colonies (Earlé 2022).

The attempt to restore the *Lithops coleorum* colonies firstly involves the continuous monitoring and safeguarding the few plants still left in habitat. To achieve this, the colonies were visited in May 2022



6: Cultivated 10-month-old *Lithops coleorum* plants destined for re-introduction into habitat, grown by Arnold Frisby.

during which all 14 *L. coleorum* plants were located and their positions noted with GPS readings for permanent individual marking. Several photographs of each plant were taken with at least one photo with a standard sized marker in view which will enable us to determine the size of the plants, damage to the leaves as well as approximate flowering period and the development of the fruits (Fig. 5). These individually marked plants will be monitored via photographs as often as possible, ideally once or twice a year, for the duration of the project. The *Lithops* Foundation is collaborating with Arnold Frisby, the Curator of the Cycad and Indigenous Plant Nursery at the University of Pretoria, as he is involved in other botanical research in an area close to the colonies.

Also vitally important to the restoration of the colonies is the introduction of new plants into habitat to bolster the population and thus safeguard the in-habitat seed production for natural population growth in the future. To this end both Arnold Frisby and Dr Ernst Vermaak are cultivating *Lithops coleorum* plants in South Africa for future habitat re-introducing (Fig. 6). Establishing cultivated *Lithops* plants in habitat is a lengthy process as the plants grow slowly and to cultivate the plants from seeds until they are ready for re-introduction into their natural habitat takes a minimum of three years.

From previous re-introduction studies of *Lithops* plants (Earlé et al. 2017) it was determined that predation especially by mice is a major factor in the failure of plants to be established in habitat. To combat this kind of predation a large number of wire plant protectors will have to be manufactured to be placed over each plant or a group of plants which might be close to each other. Also, at least two breeding boxes for owls will be erected on the edge of the existing colonies to attract owls to the area as a biological control of the mice population.

An established adult plant population of at least 100 plants should be present in a colony before the colony could be regarded as not being severely threatened. This might take several years to achieve and *Lithops coleorum* plants will be cultivated and re-introduced to the habitat for at least ten years. Surplus seeds which are not required for the cultivation of plants will be distributed in the habitat in an attempt to increase the seed bank in the soil and thus increase the possibility of natural in-habitat seed germination when conditions are favorable.

Acknowledgements

The *Lithops* Foundation is grateful for the financial support from the CSSA which enabled us to get the project off the ground. We are also privileged to have the co-operation of Arnold Frisby and Dr Ernst Vermaak who are cultivating the plants and are assisting with monitoring the in-habitat plants. Thanks also to Steven Hammer and Keith Green for supplying some background information about the colonies as well as photos of plants taken in 2010. Thanks to Janet Snyman who prepared some of the figures for publication.

Literature Cited

- Earlé, R. and T. Schoeman. 2012. Unequal sized head formation in *Lithops ruschiorum* var. *ruschiorum*. *Mesemb Study Group Bulletin* 27(4): 101–102.
- Earlé, R., J. Round and H. Mouton. 2017. Reintroduction of *Lithops schwantesii* subsp. *gebseri* into its natural habitat in Namibia. *Cactus World* 35(4): 273–276.
- Earlé, R.A. and J.E. Round. 2021. *Lithops in habitat and cultivation*. The Lavenham Press. Page 49.
- Earlé, R.A. 2022. Conservation research of *Lithops* N.E.Br. in Namibia and South Africa – a multi-decade term project. *Bradleya special* 2022: 54–62.
- Hammer, S.A. and R.R.J. Uij. 1994. *Lithops coleorum*, a new species from the Northern Transvaal. *Aloe* 31(2): 36–38.
- Jainta, H. 2017. *Wild Lithops*. Klaus Hess.